

Camera Timing Circuit

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Camera Timing Circuit

Goal

- Build a circuit to take pictures at regular intervals

Develop Specifications

- Interval
 - How many pictures?
- Power required?
- How to Take a picture

Camera Timing Circuit

How Many Pictures?

- Memory Size: _____
- Clear Memory
- Set to Highest resolution
- Take ten pictures
 - How long does it take?
 - How many pictures remain?
- How many pictures fit on the Card? _____

Interval?

- Flight Duration
 - Estimate 3 hrs
 - 2 hrs ascent
 - 1 hr descent
 - Minutes?
 - Seconds?
- Picture rate: # pictures/time
 - _____ sec/picture
- Picture Interval: time/picture
 - $1/\text{rate}$: _____ sec/picture

Camera Timing Circuit

Camera

- Digital Cameras use a button (Short Circuit) to take a picture.
- Most use two contacts
 - 1) focus & lighting adjustments (half-press)
 - 2) take picture
- Our's uses One contact
- How long a 'pulse is required to take a picture?
 - Can you press the button to fast?
- Estimate 0.1 – 0.2 seconds
- How long to process (save) the image?
 - How long did 10 pictures take?

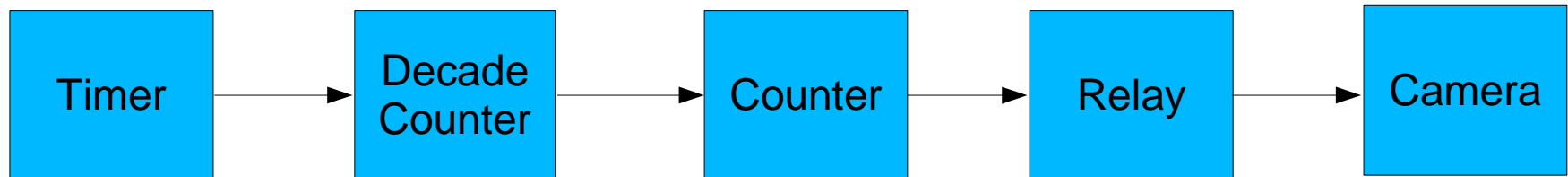
Camera Timing Circuit Block Diagram Specifications

- 0.2 sec pulse (minimum)
- Maximum Interval _____
- Minimum Interval _____
- Power: 5-9

Timer Shapes a pulse

Counter Spaces them out

Relay triggers the camera



Camera Timing Circuit

Digital Integrated Circuit

Typical

- Require:
 - Power
 - Input
 - Output
 - (conditioning/modification signal)
- 555 Timer
 - Uses Resistor & Capacitor to shape Pulse
 - (High) $T1 = 0.67 R1 * C$
 - (Low) $T2 = 0.67 R2 * C$
 - Interval = $T1(\text{high}) + T2(\text{low})$

Let $C = 0.3 \mu\text{F}$
 $R1 = 1 \text{ Mohm}$
 $R2 = 1.5 \text{ MOhm}$

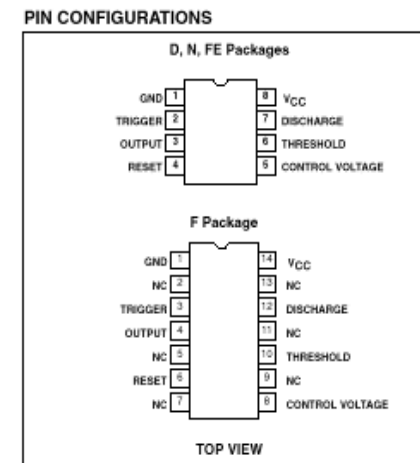
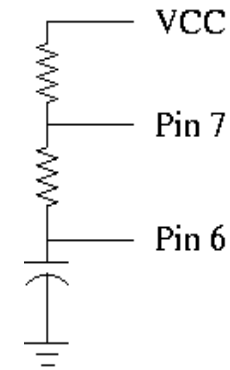
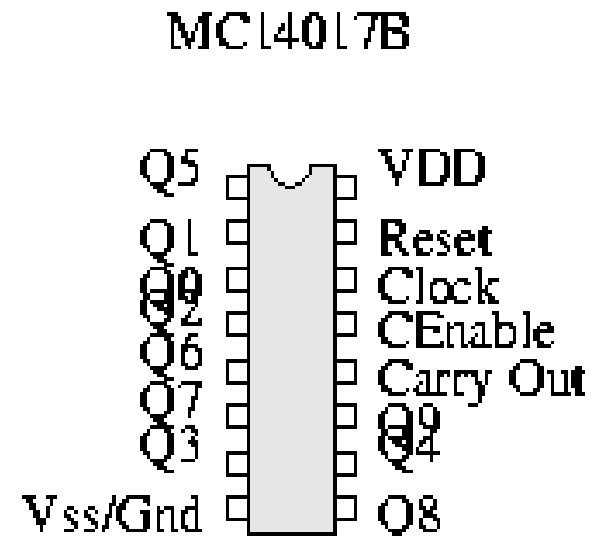


Fig 1. 555 Timer Pin Configurations

Camera Timing Circuit

MC 14017B Decade Counter

- Provide Power
 - 3 to 18V
- CE (Clock Enable)
- Input (CLK)
- Output
- Reset

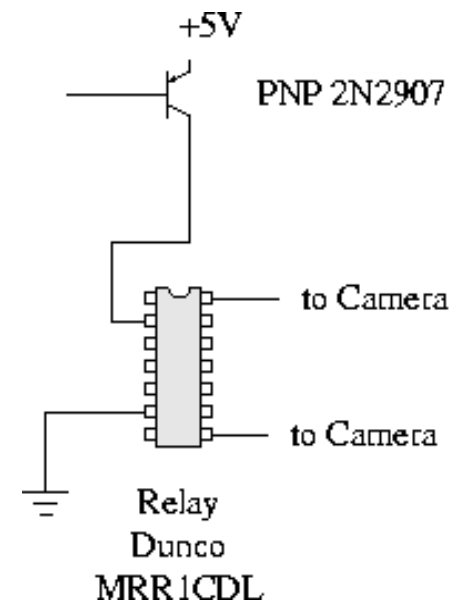


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Relay Circuit

Relay

- Transistor (amplifier) used to power relay



Camera Timing Circuit

Soldering

- Soldering Iron is HOT.
- Tin leads.
 - Tinning clean leads.
 - “Cleanliness is next to Godliness.”
 - Add solder to each lead before soldering together.
- Use pliers to bend leads.
- Cut wires a little long.
 - To reduce tension.

Camera Timing Circuit Schematic Diagram

